
What is claimed is:

B1 1. A wiring board comprising:

a base board;

5 a first hole, formed through the base board, including an insulating portion filled with an insulator; and

a pair of second holes formed within the first hole through the insulating portion.

2. The wiring board according to claim 1,

10 wherein each of the second holes includes a conducting portion for transmitting a differential signal.

3. The wiring board according to claim 1,

wherein the pair of the second holes is located symmetrically each other with respect to a center axis of the first hole for forming a coaxial structure.

15 4. The wiring board according to claim 1,

wherein a shortest length of the insulator filled between the pair of the second holes is shorter than a shortest length of the insulator filled between the first hole and one of the second holes.

5. The wiring board according to claim 1,

20 wherein the base board includes an insulating layer,

wherein the insulating portion is filled with an insulator which has a higher dielectric constant than an insulator in the insulating layer.

6. The wiring board according to claim 5, wherein the first hole includes the insulating portion without forming a plating portion between the first hole

25 and the insulating portion.

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7. The wiring board according to claim 1 further comprising insulating layers on an upper surface and a lower surface of the base board,

wherein the second holes are formed through the insulating layers,

wherein the insulating layers include at least two pairs of wiring patterns formed on the upper surface and the lower surface of the base board,

5 wherein the pair of the second holes connects the two pairs of the wiring patterns,

wherein the pair of the second holes is formed by calculating a diameter of the pair of the second holes and a length between the pair of the second holes based on an impedance of the pair of the second holes and an impedance of the two pairs of the wiring patterns.

10 8. The wiring board according to claim 1,

wherein the wiring board is a multi-layer wiring board including at least two conductor layers coated with a conducting material.

15 9. The wiring board according to claim 8,

wherein the first hole is formed at least through the two conductor layers,

wherein the pair of the second holes is formed by forming insulating layers on an upper surface and a lower surface of the two conductor layers, forming a plurality of wiring patterns on an upper surface and a lower surface of the insulating layer, and forming holes through at least four layers of the two conductor layers and two insulating layers.

20 10. A method for manufacturing a wiring board comprising:

forming a first hole through a base board;

25 forming an insulating portion by filling the first hole with an insulator;

and

forming a pair of second holes through the insulating portion.

11. The method for manufacturing the wiring board according to claim 10,
wherein the base board includes an insulating layer,

5 wherein the forming the insulating portion is filling the first hole with
an insulator with a higher dielectric constant than an insulator used in the
insulating layer.

12. The method for manufacturing the wiring board according to claim 10,
wherein the base board has an insulating layer,

10 wherein the forming the first hole is filling the insulating portion with
an insulator which has a higher dielectric constant than the insulating layer
without forming plating portion within the first hole.

13. A method for manufacturing the wiring board comprising:

15 forming a first hole through a base board including conductor layers at
an upper surface and a lower surface;

forming an insulating portion by filling the first hole with an insulator;

forming insulating layers on both the upper surface and the lower
surface of the base board by using the insulator; and

20 forming a pair of second holes through the insulating portion and the
insulating layers.

14. The wiring board according to claim 2,

wherein a shortest length of the insulator filled between the pair of the
second holes is shorter than a shortest length of the insulator filled between
the first hole and one of the second holes.

25 15. The wiring board according to claim 3,

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wherein a shortest length of the insulator filled between the pair of the second holes is shorter than a shortest length of the insulator filled between the first hole and one of the second holes.

16. The wiring board according to claim 2,

5 wherein the base board includes an insulating layer,

wherein the insulating portion is filled with an insulator which has a higher dielectric constant than an insulator in the insulating layer.

17. The wiring board according to claim 3,

wherein the base board includes an insulating layer,

10 wherein the insulating portion is filled with an insulator which has a higher dielectric constant than an insulator in the insulating layer.

18. The wiring board according to claim 4,

wherein the base board includes an insulating layer,

15 wherein the insulating portion is filled with an insulator which has a higher dielectric constant than an insulator in the insulating layer.

19. The wiring board according to claim 3 further comprising insulating layers on an upper surface and a lower surface of the base board,

wherein the second holes are formed through the insulating layers,

20 wherein the insulating layers include at least two pairs of wiring patterns formed on the upper surface and the lower surface of the base board,

wherein the pair of the second holes connects the two pairs of the wiring patterns,

wherein the pair of the second holes is formed by calculating a diameter of the pair of the second holes and a length between the pair of the

25 second holes based on an impedance of the pair of the second holes and an

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end impedance of the two pairs of the wiring patterns.

20. The wiring board according to claim 3,

wherein the wiring board is a multi-layer wiring board including at least two conductor layers coated with a conducting material.
